CĂTĂLINA CANGEA

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PERSONAL PROFILE

Third-year PhD student at the University of Cambridge, focused on learning multimodal and graph-structured representations of the world. Born on May 17, 1994 in Ploieşti, România.

EDUCATION

Department of Computer Science and Technology, University of Cambridge, UK

PhD in Machine Learning (October 2017–2021 (expected))

MPhil in Advanced Computer Science (October 2016–July 2017) *Distinction (81%)*

BA in Computer Science (October 2013–June 2016) *First Class (75%) - 3rd year*

Colegiul Naţional "I.L.Caragiale", Ploieşti, România

Computer Science & Mathematics (September 2009–May 2013) *Valedictorian (grade 10/10)*

SELECTED RESEARCH PUBLICATIONS

Message Passing Neural Processes (joint first)

Neural Process with relational inductive bias for graph-structured datasets. Strong generalisation on Cellular Automata tasks, significant gains in arbitrary-labelling and few-shot tasks. Under review.

Graph Density-Aware Losses for Novel Compositions in Scene Graph Generation (third)

Novel density-normalized edge losses and weighted metrics for few/zero-shot scene graph generation, at no extra computational cost. Results on Visual Genome and GQA. *BMVC 2020.*

Deep Graph Mapper: Seeing Graphs through the Neural Lens (joint first)

A fusion between Mapper (a Topological Data Analysis method) and graph neural networks that produces highly informative graph visualisations and a powerful pooling layer. *NeurIPS-W 2020 TDA.*

VideoNavQA: Bridging the Gap between Visual and Embodied Question Answering

Novel task that studies QA performance in EQA-like settings with nearly-ideal navigation paths. Generalised VQA models for temporal reasoning. *BMVC 2019*, *NeurIPS-W 2019 ViGIL* spotlight.

Towards Sparse Hierarchical Graph Classifiers (joint first)

CNN-like architecture with sparse pooling for graph-structured data. Matched SOTA on benchmarks, memory reduced from $O(V^2)$ to $O(V + E)$. *NeurIPS-W 2018 R2L.*

XFlow: Cross-modal Deep Neural Networks for Audiovisual Classification

Cross-modal dataflow multimodal architectures. SOTA on benchmarks. *IEEE Transactions on Neural Networks and Learning Systems 2019*, *ARM Research Summit 2017*, *ICDL-EPIROB-W 2017 CMCML.*

PROFESSIONAL EXPERIENCE

Research Scientist Intern—DeepMind July 2020–November 2020

Hosted by Piotr Mirowski in the Robotics, Embodied Agents and Lifelong learning (REAL) team led by Raia Hadsell.

Consultant—Relation Therapeutics June 2020–July 2020

Developing (graph-)ML solutions to aid in drug development and repurposing efforts.

AI Resident—X, the moonshot factory May 2019–August 2019

Worked on an early-stage project, using and adapting recent ML techniques to a real-world problem.

Research Intern—Mila July 2018–September 2018

Collaboration with Aaron Courville on a visual reasoning project which resulted in a novel benchmark and alternative perspective on EQA-style tasks. BMVC publication and NeurIPS ViGIL spotlight talk.

Software Engineer Intern—Facebook London June 2016–September 2016

Worked on the LogDevice team, making client operations on a distributed RocksDB data store more efficient and flexible, while leading to fewer system failures.

Software Engineer Intern—Facebook New York July 2015–September 2015

Worked on iOS Product Infrastructure to reduce the time taken by the Facebook iOS app to load content close to the screen current view. Improved the infrastructure and network request prioritisation system.

STEP Intern—Google Zürich June 2014–September 2014

Added processing progress for video uploads on YouTube. Developed a JavaScript client implementation that requests processing information from the server and thumbnail rendering of processing videos.

EXTRACURRICULAR ACTIVITIES

Co-organiser, ViGIL Workshop, North American Chapter of the ACL 2021 2020–June 2021

Machine Learning Teaching Fellow, Cambridge Spark May 2018–present

Chair/Deputy chair, women@CL, University of Cambridge October 2018–July 2020

TEACHING / SUPERVISING

Lectures: *Graph Generation Methods - R250 Advanced Topics in ML and NLP (Master's course)* (2020)

Master's projects: *Goal-conditioned Reinforcement Learning in the Presence of an Adversary* (2019–20, NeurIPS-W DeepRL), *Representation Learning for Spatio-Temporal Graphs* (2018–19, ICLR-W RLGM), *Dynamic Temporal Analysis for Graph Structured Data* (2018–19, ICLR-W RLGM)

Undergraduate projects: *Benchmarking Graph Neural Networks using Wikipedia* (2019–20, spotlight talk at ICML-W GRL+), Multimodal Relational Reasoning for Visual Question Answering (2019–20), *The PlayStation Reinforcement Learning Environment* (2018–19, NeurIPS-W DeepRL), *Deep Learning for Music Recommendation* (2017–18)

Courses: AI, Databases, Discrete Maths, Foundations of CS, Logic & Proof, ML & Real-World Data

PROFESSIONAL SKILLS

Programming Languages Python, C, C++, Standard ML, Java, C#, Objective-C, JavaScript
Machine Learning APIs PyTorch, JAX, Keras, TF1, PyG, Haiku, Graph Nets, Sonnet, CUDA

LANGUAGES

English (fluent), French (beginner), Romanian (native)

INTERESTS

Music Guitar and vocals in a rock band—we play in colleges, pubs and at Cambridge May Balls

Rowing King's Women's First Boat (Jan 2018–present), Darwin/King's Second Boat (Jan–Dec 2017)